

AMENDMENTSIn the Claims

1. (Previously Presented) The method of claim 36 wherein said first cache is maintained by said upper-level system.
2. (Original) The method of claim 1, wherein a single cache comprises said first and said second caches.
3. (Canceled)
4. (Previously Presented) The method of claim 1, further comprising:
partially writing a unit of storage of a storage unit by writing a portion of said information from said second unit of storage to said unit of storage of said storage unit; and
partially writing said unit of storage of said storage unit by writing new information to said unit of storage of said storage unit.
5. (Previously Presented) The method of claim 1, wherein said cloning comprises:
reading said information from said first unit of storage; and
writing said information to said second unit of storage.
6. (Previously Presented) The method of claim 5, further comprising:
writing to said first unit of storage after said reading.
7. (Original) The method of claim 5, further comprising:
reading said information from said second unit of storage; and
calculating parity information using said information.

8. (Canceled)

9. (Previously Presented) The method of claim 1, wherein said cloning comprises:

said first unit of storage is to be modified if said first unit of storage is to be written to.

10. (Previously Presented) The method of claim 1, further comprising: reading said information from said second unit of storage; and calculating parity information using said information.

11. (Previously Presented) The method of claim 1, further comprising: modifying said first unit of storage after said performing said cloning.

12. (Original) The method of claim 11, wherein said modifying comprises: writing to said first unit of storage.

13. (Original) The method of claim 1, wherein said cloning comprises: determining if said information will be needed in the future; and performing said cloning if said information will be needed in the future.

14. (Currently Amended) A storage system comprising:
an old data cache, wherein

said old data cache is configured to be maintained by one of an upper-level system and a lower-level storage module by virtue of said old data cache being configured to provide read access and write access by said one of said upper-level system and said lower-level storage module, and

said old data cache is further configured to be accessed by the other of said upper-level system and said lower-level storage module by virtue of said old data cache being configured to provide read

**access and write access by said other of said upper-level system
and said lower-level storage module.**

15. (Previously Presented) The storage system of claim 14, wherein said upper-level system is communicatively coupled to said old data cache; and said lower-level storage module is communicatively coupled to said old data cache and said upper-level system.
16. (Previously Presented) The storage system of claim 15, wherein said lower-level storage module is a volume manager.
17. (Previously Presented) The storage system of claim 16, wherein said lower-level storage module comprises a cache.
18. (Previously Presented) The storage system of claim 17, wherein said lower-level storage module is configured to clone information from a page in said cache to a page in said old data cache.
19. (Original) The storage system of claim 18, wherein said upper-level system is configured to access said page in said old data cache.
20. (Original) The storage system of claim 15, wherein said upper-level system comprises a cache.
21. (Original) The storage system of claim 20, wherein said upper-level system is configured to clone information from a page in said cache to a page in said old data cache.
22. (Previously Presented) The storage system of claim 21, wherein said lower-level storage module is configured to access said page in said old data cache.
23. (Original) The storage system of claim 20, wherein

said upper-level system is one of a filesystem, a database and a hardware RAID controller.

24. (Previously Presented) The storage system of claim 15, further comprising:

storage unit, wherein

said lower-level storage module is coupled to control said storage unit.

25. (Original) The storage system of claim 24, further comprising:

a parity cache, wherein

said storage unit is a RAID, and

said parity cache is configured to store parity information corresponding to data read from said RAID.

26. (Original) The storage system of claim 24, wherein

said storage unit comprises a source volume and a snapshot volume, and

said lower-level storage module is configured to write information from a page in said old data cache to said snapshot volume.

27. (Currently Amended) An apparatus comprising:

an upper-level system comprising a first cache, wherein

said first cache is configured to provide read access and write access by said upper-level system;

a second cache, wherein

said second cache is configured to provide read access and write access by a lower-level storage module; and

means for cloning information stored in a first unit of storage into a second unit of storage, wherein

said first unit of storage is stored in said first cache, [[and]]

said second unit of storage is stored in said second cache, ~~wherein~~ and

said second cache is configured to be accessed by [[a]] said lower-level storage module.

28. (Original) The apparatus of claim 27, wherein
 said means for cloning comprises
 means for copying said information from said first unit of storage to said
 second unit of storage; and
 said apparatus further comprises
 means for partially writing a unit of storage of a storage unit comprising
 means for writing a portion of said information from said second
 unit of storage to said unit of storage of said storage unit, and
 means for partially writing said unit of storage of said storage unit
 comprising means for writing new information to said unit of
 storage of said storage unit.

29. (Original) The apparatus of claim 27, wherein
 said means for cloning comprises
 means for reading said information from said first unit of storage, and
 means for writing said information to said second unit of storage; and
 said apparatus further comprises
 means for writing to said unit of storage, operable to write to said unit of
 storage after an operation of said means for reading.

30. (Currently Amended) A storage system comprising:
an upper-level system comprising a first cache, wherein
 said first cache is configured to provide read access and write access
 by said upper-level system;
a second cache, wherein
 said second cache is configured to provide read access and write
 access by a lower-level storage module;
 a processor;
 computer readable medium coupled to said processor; and
 computer code, encoded in said computer readable medium, configured to cause
 said processor to:
 clone information stored in a first unit of storage into a second unit of
 storage, wherein

said first unit of storage is stored in a first cache maintained by an upper-level system, and
 said second unit of storage is stored in a second cache configured to be accessed by a lower-level storage module.

31. (Original) The storage system of claim 30, wherein
 said computer code configured to cause said processor to clone said information
 is further configured to cause said processor to copy said information
 from said first unit of storage to said second unit of storage; and
 said computer code is further configured to cause said processor to
 partially write a unit of storage of a storage unit by virtue of being
 configured to write a portion of said information from said second
 unit of storage to said unit of storage of said storage unit, and
 partially write said unit of storage of said storage unit by virtue of being
 configured to write new information to said unit of storage of said
 storage unit.

32. (Original) The storage system of claim 30, wherein
 said computer code configured to cause said processor to
 read said information from said first unit of storage, and
 write said information to said second unit of storage; and
 said computer code is further configured to cause said processor to
 write to said unit of storage after said reading.

33. (Currently Amended) A computer program product comprising:
~~a tangible computer-readable-medium-encoding;~~
 a first set of instructions, executable on a computer system, configured to clone
 information stored in a first unit of storage into a second unit of storage,
 wherein
 said first unit of storage is stored in a first cache maintained by an upper-
 level system, **[[and]]**
 said second unit of storage is stored in a second cache configured to be
 accessed by a lower-level storage module,

said first cache is configured to provide read access and write access
by said upper-level system, and
said second cache is configured to provide read access and write
access by said lower-level storage module; and
computer readable storage media, wherein said computer program product
is encoded in said computer readable storage media.

34. (Currently Amended) The computer program product of claim 33, wherein said first set of instructions comprises
- a first subset of instructions, executable on said computer system, configured to clone said information is further configured to cause said processor to copy said information from said first unit of storage to said second unit of storage; and
- said ~~tangible computer readable medium~~ computer program product further encodes:
- a second set of instructions, executable on said computer system, configured to partially write a unit of storage of a storage unit by virtue of being further configured to cause said processor to write a portion of said information from said second unit of storage to said unit of storage of said storage unit, and
 - a third set of instructions, executable on said computer system, configured to partially write said unit of storage of said storage unit by virtue of being further configured to cause said processor to write new information to said unit of storage of said storage unit.

35. (Currently Amended) The computer program product of claim 33, wherein said first set of instructions comprises
- a first subset of instructions, executable on said computer system, configured to read said information from said first unit of storage, and
 - a second subset of instructions, executable on said computer system, configured to write said information to said second unit of storage; and

said ~~tangible computer readable medium~~ **computer program product** further encodes:
 a second set of instructions, executable on said computer system,
 configured to write to said unit of storage after said reading.

36. (Currently Amended) A method comprising:
 maintaining a first cache, wherein
 said maintaining is performed by one of an upper-level system and a
 lower-level storage module, **and**
 said first cache is configured to provide read access and write access
 by said one of said upper-level system and said lower-level
 storage module;
 cloning information stored in a first unit of storage into a second unit of storage,
 wherein
 said first cache comprises said first unit of storage and a second cache
 comprises said second unit of storage; and
 accessing said second cache, wherein
 said accessing is performed by the other of said upper-level system and
 said lower-level storage module, **and**
 said second cache is configured to provide read access and write
 access by said other of said upper-level system and said lower-
 level storage module.

37. (New) The method of claim 2, wherein
 said first and said second caches at least partially comprise one another.